Chemical Residual Removal for Children Associated With Clandestine Methamphetamine Laboratories
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Introduction:

Chemical residuals present on persons and items associated with clandestine methamphetamine laboratories continue to be a major concern for many jurisdictions. This is especially true regarding the potential chemical residuals present on children associated with these laboratories. The need to provide further clarification was determined based on feedback from a number of presentations and conferences that have been held regarding clandestine methamphetamine laboratories, as well as emails received by members of the Scientific and Medical Research Working Group (SMRWG) of the National Alliance for Drug Endangered Children.

To provide general guidelines that may be utilized by jurisdictions with different capabilities and needs, the SMRWG has devised the following protocols designed for the treatment of children removed from or associated with clandestine methamphetamine laboratories. These protocols may not apply to children present where methamphetamine or other drugs were only used and not manufactured, nor do they apply to other kinds of hazardous materials incidents and/or personnel associated with laboratory investigations. Guidelines for the care of children present where methamphetamine was smoked but not manufactured will be presented in a future guideline.

What is Known:

- Based on sampling conducted by National Jewish Medical and Research Center and others at actual clandestine laboratories and controlled methamphetamine cooks, we know that a wide variety of solvents, acids, bases, iodine, phosphorous, phosphine, anhydrous ammonia, methamphetamine and other compounds may be present at a clandestine methamphetamine laboratory.[1-11]

- The compounds that will be present will depend upon the method of manufacture utilized, the temperatures at which the cook is conducted, and the idiosyncrasies of the individual conducting the cook. The compounds and amounts will also depend upon the incidence of accidents, fires and spills, and will likely be higher during active cooks.[1]

- Individuals and items associated with the clandestine manufacture of methamphetamine or the area in which the "cook" was conducted may have residual surface levels of at least some of these compounds present (i.e. on clothes and skin). The magnitude of these residual levels will depend upon their proximity to the cook area, the type of cook, the temperature of the cook, the amount of the cook, ventilation systems utilized, etc. [1,2,3,4]

- Generally speaking, residual chemical levels will be highest on the individual conducting the methamphetamine manufacturing process and lowest on an individual that was not present during the cook and just entered the structure for a short period of time. Demonstrated methamphetamine levels range from no methamphetamine detected to as high as 580 ug/wipe on a cook's hands. Exterior levels of methamphetamine found on the protective equipment of individuals after a single cook are generally less than 50 ug/wipe (approximately 100 cm^2). Expected levels of residual chemicals, other than methamphetamine, are not known at this time.[1,4]

- After a staged clandestine methamphetamine manufacturing process, residual levels of methamphetamine were present on most surfaces near the area in which the cook was conducted, and most individuals entering this area did pick up some methamphetamine on their outer clothes and skin. After a single cook, the residual level found on clothing will depend on many factors but generally is found to be less than 20 ug/wipe. Multiple cooks may result in higher contamination levels. In addition, high activity levels (cleaning, crawling on the floor, etc) or direct contact with the chemicals may also result in higher residual levels on clothing, skin, etc.[1,4]

- At this time, there is no known existing methodology by which to reliably determine the residual levels of these chemicals on a real-time basis. Photo ionization devices, organic vapor meters, explosion meters, ion mobility spectrometers, and immunochemistry devices all appear to have limitations that make them unreliable for determining relevant residual chemical levels on individuals or surfaces.

- It is expected, based on research conducted on pesticides, that transfer rates of chemicals from the surface of an individual or item associated with a methamphetamine lab to the surface of a person not associated with a lab may be as low as 10%. It has been demonstrated in the field that simply handling individuals associated with a methamphetamine laboratory may result in the transfer of very low but detectable amounts of methamphetamine. We predict, however, that even if some methamphetamine is transferred, only a small proportion will be absorbed into the body of another person coming into contact with the child.

- The effectiveness of wipes to decontaminate large surfaces or semi-porous items has not been documented. In addition, wipes are totally ineffective in removing chemical residuals from porous surfaces. Research suggests that wipes are more likely to spread chemical residuals than to remove these residuals from skin. Warm soap and water has been found to be much more effective in removing methamphetamine contamination and is the preferred method of chemical removal.

What is not Known:

- The expected amounts of residual chemicals, other than methamphetamine, that are transferred to individuals entering a methamphetamine laboratory are unknown. Many of the chemicals associated with the manufacture of methamphetamine are not easy to detect on surfaces and sampling has not been conducted at this time.

- Although the use of soap and water has been shown to significantly reduce chemical residuals on the smooth protective clothing of emergency personnel, no studies have documented the efficacy of washing individuals or clothes with soap and water for chemical residual removal.[4] It is assumed, however, that washing with warm water and soap does effectively remove at least methamphetamine residuals from clothes, surfaces, or items as long as they can be totally immersed in the water.

- The no-effect or no observable effect exposure level for methamphetamine is not known at this time. This is especially true for infants and children.

- It is not known at this time if methamphetamine can be absorbed through the skin. If it is absorbed, it is assumed to be a minor route of entry and unlikely to pose a greater threat than oral ingestion, injection, or inhalation. Small amounts of skin contact are unlikely to result in acute reactions to most adult workers coming into contact with children from clandestine methamphetamine laboratories.

Recommendations:

1. We believe, as stated in the National Protocol for Medical Evaluation of Children Found in Drug Labs, **that any child who is in medical distress or has been involved in an explosion or other event that has resulted in significant chemical exposure, burns, etc**. should be transported to the emergency department as quickly as possible. We believe that basic life support must take precedence over decontamination. Although decontamination should be conducted as soon as is possible, it must not delay the transportation of a critically injured child.

2. **In those cases where significant chemical exposure has occurred and there is evidence of an exposure such as a chemical smell on the person, wet clothes, clothes covered with visible chemical, etc.,** the children involved should have the chemical residuals removed at the scene removing their clothes and providing a warm shower with soap in a non-threatening situation. In this case, showering at the scene is preferred if it can be done without trauma to the child. If shower capability is not available at the scene, then the child should be dressed in other clothing and transported to an area where chemical residual removal can be

accomplished without trauma to the child. Any clothing worn by the child should be removed at the scene for disposition by law enforcement personnel.

3. **In situations where an asymptomatic child has been removed from a clandestine methamphetamine laboratory and there is no sign of obvious chemical contamination on the child (odor, visible chemical, etc),** significant danger to individuals coming in contact with the child is not likely. However, the committee believes that it is in the public health interest to minimize chemical exposures, no matter how minimal, to chemicals for which there is incomplete toxicity information. The committee also believes that the presence of a significant chemical residual is possible since current real-time detection methodology is not available. Therefore, the committee suggests that communities develop a protocol, based on the capabilities of the community, to provide these children with adequate chemical residual removal. We suggest that this protocol involve the following:

    a. Although full and immediate decontamination is not necessary, the clothes that the child is wearing should be removed as soon as is reasonably safe and a shower provided when conditions enable a safe and relatively trauma-free shower. It is unlikely that significant amounts of methamphetamine or other chemicals will be transferred from clothing but we believe that a cloth draped over vehicle seats will provide further protection if desired.

    b. Showering the child with warm water in an expedient manner in an area where privacy is provided also protects the child from unreasonable trauma. This may be conducted at the scene, if adequate facilities are present, at a hospital, at a fire station, or any other location that is identified by local protocol.

    c. After the child has showered or if the clothes are removed at the scene, a responsible agency (denoted by the protocol) should retain all of the clothes for washing, disposal or retention for evidence. Although further testing may show that washing the clothes in hot water may be adequate, at this time, we suggest that the clothes be discarded by the responsible agency.

    d. Before, during, and after decontamination, care should be taken to make sure that children are kept warm during transfers to prevent hypothermia.

4. **In the instance where a clandestine methamphetamine laboratory has been identified and the children that are normally associated with that laboratory are in a school, day care center, foster home, etc. at the time of the investigation**, the children should be visited by the appropriate agency personnel (law enforcement, child protective services, school nurse, etc.) and the following appropriate determination made:

a. **Children that appear to be ill or chemically contaminated should be immediately transported to a medical facility for full decontamination and/or treatment**. We believe that basic life support must take precedence over decontamination. Although decontamination should be conducted as soon as is possible, it must not delay the transportation of a critically injured child. This scenario is unlikely in a school or day care situation since a chemically contaminated child will usually be identified by school staff members prior to agency personnel arrival.

b. **In situations where an asymptomatic child has been located at a school, daycare center, etc. and there is no sign of obvious chemical contamination on the child (odor, visible chemical, etc),** the child is not likely to present a significant danger to other children or facility personnel coming into contact with the child. However, the committee believes that it is in the public health interest to minimize chemical exposures, no matter how minimal, to chemicals for which there is incomplete toxicity information. We therefore suggest the following:

    i. Although full and immediate decontamination is not necessary, the clothes that the child is wearing should be removed as soon as is reasonably safe and a shower provided when conditions enable a safe and relatively trauma-free shower. It is unlikely that significant amounts of methamphetamine or other chemicals will be transferred from clothing but we believe that a cloth draped over vehicle seats during transport will provide further protection if desired.

    ii. Showering of the child with warm water in an expedient manner that also protects the child against unreasonable trauma in an area where privacy is provided. This may be conducted at the school or daycare center, if adequate facilities are present, at a hospital, at a fire station, or any other location that is identified by local protocol.

    iii. After the child has showered or if the clothes are removed at the school or daycare center, a responsible agency (denoted by the protocol) should retain all of the clothes for washing, disposal or retention for evidence. Although further testing may show that washing the clothes in hot water may be adequate, at this time, we suggest that the clothes be discarded by the responsible agency.

    iv. Unless there is evidence that the involved children have significant chemical contamination (chemical odors, illness, etc.) we do not believe that other children present at the school or daycare center need be involved with the cleaning process or subjected to any

other cleaning activities. The extraordinary cleaning of school property associated with methamphetamine-associated children is also unnecessary under these conditions.

5. It is recommended that baby wipes not be used as a substitute for a warm shower since there is little added efficacy that has been demonstrated. In fact, wipes have been found to spread contamination rather than remove it.

6. Children should be provided a medical and developmental assessment prior to or after showering. This assessment should be in accordance with the protocols presented in the National Protocol for Medical Evaluation of Children Found in Drug Labs, available at no charge from the National Alliance for Drug Endangered Children (www.nationaldec.org).

References

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